

REMARKS

Claims 1-5, 8-14 and 16-22 appear in this application for the Examiner's review and consideration, of which claims 1, 3, 19, and 20 are currently amended. The amendments are fully supported by the originally filed specification, claims, and drawings.

In the Office Action, claim 19 was rejected under 35 U.S.C. 103(a) as obvious over Matsui et al. (U.S. Patent No. 6,191,007) in view of Tayanaka (U.S. Patent No. 6,107,213). Claims 1-4, 8-11, 16-18, 20, 21 were rejected under 35 U.S.C. 103(a) as obvious over Matsui et al. in view of Tayanaka and in further view of Hanson et al. (U.S. Patent No. 5,920,764).

Claims 1, 19, and 20 recite a method of thinning a wafer of semiconductor material that has a first face supporting an electronic component or circuit. Atomic species are implanted through an opposite second face to obtain a zone of weakness defining a remaining portion between the zone and the first face, a stiffener is applied to the second face, and the stiffener and a remaining portion are removed from the first portion. The removing is conducted to thin the wafer. Claims 1 and 20 recites that the implanting and removing steps are repeated, thus thinning the wafer, until the first portion has a reduced thickness but is still a self-supported thin layer, and that the electronic component or circuit is supported on the first face of the wafer. Claim 19 recites that the removing step is conducted to thin the wafer with the electronic component or circuit on the first face. Thus, in both claims, the method achieves a thinned wafer, with the electronic component or circuit on the same face of the wafer, opposite from the one from which the material has been removed.

The Office Action cites Fig. 22 Matsui to show a implantation into a face opposite from pattern members 115. Then , Figs. 2C and 3C are cited to show a step of removing a portion of the wafer. The argument is made in the Action that Tayanaka's teaching of applying a flexible film to opposite sides of a wafer would be combined with Matsui, and that this would render the claims obvious.

Matsui, however, does not teach implantation and removal of a portion of a wafer to thin the wafer, with electronic components or circuitry that is on a first face both before implantation and after the material removal. To the contrary, Matsui directed to transferring a pattern, such as an electrode pattern, from a substrate 1, to a substrate 8. Consequently, while the pattern starts out on one face of the initial wafer during implantation,

since another substrate is attached to this face, it ends up on an opposite face of the final wafer from where it started. Moreover, this opposite face was not a face during the implantation because it was within the wafer at the region where the implantation took place.

Referring specifically to the figure mentioned in the Office Action, Fig. 22 shows a "Tenth Preferred Embodiment," which is a modification of a "Fifth Preferred Embodiment" shown in Figs. 14-17D. (Matsui at 28:53-56, 34:56-61.) Fig. 22 replaces Fig. 17A in the Tenth Preferred Embodiment. It is seen that in Fig. 17C a base substrate 112 is attached to what was, during implantation, the face with the pattern 115. Thus, when substrate 118 is detached in Fig. 17D, the pattern 115 is no longer on that same face. If anything, the pattern 115 would be closest to a face on the opposite side of the face on which it started, but it would not be on any first face that was present at the time of the implantation.

Additionally, Matsui is not modifiable to have the pattern 115 end up on the same face as it started during implantation because the purpose of the Matsui disclosure is to transfer the pattern 115 from one substrate to another, thus being on the face of one substrate, and then attached to the face of another substrate. On the other hand, claims 1, 19, and 20 define a process in which a wafer is thinned to a point at which it is still self supporting, but the electronic component or circuit ends up on the same face on which it began.

Consequently, there is no teaching or suggestion of the invention of claim 19 in any combination of Matsui and Tayanaka.

Hansen does not remedy the deficiency of Matsui and Tayanaka since it does not provide any electronic circuitry, and as indicated above, Matsui is directed to transferring pattern 115 from one substrate to another, while Hansen is directed to restoring a rejected wafer. Specifically, circuitry that was initially on the Hansen wafer is within the thin top layer that is removed in the Hansen method to restore the wafer. (Hansen at 4:7-41.) The intent of the Hansen teaching is thus incompatible to that of Matsui, in which pattern 115 is preserved and transferred and would not be eliminated.

Thus, there is no motivation to combine the Matsui and Hansen teachings in the manner that is mentioned in the Office Action. Since the teachings must be taken as a whole, any such combination would defeat the purpose of Matsui since the Matsui pattern 115 would be destroyed. Also, Hansen does not remedy the deficiencies of Matsui and Tayanaka


addressed above. Thus, claims 1 and 20 are patentably distinct over Matsui, Tayanaka, and Hansen.

The remaining claims are dependent from claims 1, 19, or 20, and are thus also in condition for allowance.

Accordingly, it is believed that the entire application is now in condition for allowance, early notice of which would be appreciated. Should the Examiner disagree, then a personal or telephonic interview is respectfully requested to discuss any remaining issues and expedite the eventual allowance of the application.

Respectfully submitted,

Date: Oct. 31, 2007


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212-294-6610